

Tony Dixon, MB, ChB, CCFP

Diagnostic Testing: The Problem of Prevalence

THIS MONTH'S THEME is "Laboratory Medicine," and on page 327 Dr. Rick Birtwhistle makes a plea for a thoughtful, rather than a reflex process of test ordering, to improve the effectiveness and efficiency of patient care.

In 1966, Thomas Vecchio¹ published in the *New England Journal of Medicine*, what was, in retrospect, something of a landmark paper, entitled "Predictive value of a single diagnostic test in unselected populations." He described how, when a new test was being evaluated, it was customary to perform the test in two selected groups: those previously identified as having the disease in question, and those from a normal population with no evidence of the disease. Two values are thus defined: first, the sensitivity of the test, which is its ability to identify correctly the presence of disease; and secondly its specificity, which is its ability to identify the absence of disease.

Vecchio pointed out that the clinical situation in which a test is employed presents a very different challenge. Given the circumstances of clinical practice, what the physician needs to know is not so much how a test performs in known populations with and without the disease, but rather what is its predictive power: in other words, how good is the test at predicting the presence or absence of disease in unselected populations.

As Birtwhistle describes in his paper, the catch is that the power of a test to predict correctly the presence of a disease (a quality known as the 'positive predictive value') or its absence (the 'negative predictive value') depends not only on the qualities of sensitivity and specificity inherent in the test, but also on the prevalence of the disease in the population under investigation. As the prevalence of disease declines in different populations, so does a test's positive predictive value, with a consequent increase of false-positive findings.

Watson and Tang² demonstrated this dilemma when they looked at the use of prostatic acid phosphatase in the detection of carcinoma of the prostate and reported its predictive powers, using prevalences which corresponded to different clinical situations. When applied to a general population in which the prevalence of prostatic cancer might be expected to be 35/100 000, the positive predictive value of an elevated level of acid phosphatase (sensitivity of the test 70%, specificity 90%) was found to be only 0.4%. Thus, when used as a screening test, predictions of the presence of prostatic cancer on the basis of an elevated level of acid phosphatase would be wrong 99.6 times out of 100. Even in high-risk men over the age of 75 with an estimated cancer rate of 500/100 000, only 5.6% of positive tests would identify correctly the presence of the disease, and almost 18 patients out of 20 would be incorrectly diagnosed and submitted to further procedures. On the other hand, when there is a strong clinical suspicion of malignancy because, for example, a hard prostatic nodule is palpated, half of such patients will prove to have a malignancy. Under these circumstances, with a prevalence of 50 000/100 000, 93% of men with a positive test will indeed be correctly identified, and in only seven cases out of 100 will positive results be false.

Generally speaking, the prevalence of serious disease is much lower in primary-care settings than in secondary- or tertiary-care surroundings and, as a rule, the positive predictive value of the same tests performed in family practice will be much less than it is when these tests are in hospitals. Thus the indiscriminate use of diagnostic tests in primary care is likely to lead to a considerable amount of over-diagnosis, and to the investigation and treatment of healthy patients incorrectly identified as having disease on the basis of laboratory tests.

This problem is compounded by the fact that for many tests the cut-off point between 'normal' and 'abnormal' is arbitrarily set as two standard deviations from the mean. Given a Gaussian distribution of values in an unselected normal population, this means that 2.5% of observations at each end of the curve would label otherwise healthy people as 'abnormal'. This mathematical effect is magnified as more tests are done. If five tests are performed on a healthy person there is a 77% chance that the results will be judged normal, and, correspondingly, a 23% chance that an abnormality will be wrongly diagnosed. If 20 tests are done, the individual has only a 36% chance of being termed 'normal', and a 64% chance of being labelled 'abnormal'. This phenomenon leads to Murphy's³ proposition that a healthy person is anyone who has not been sufficiently investigated!!

Unfortunately, most medical education still takes place in the more esoteric environments of tertiary and secondary care, with the inevitable result that medical students are exposed to dramatically distorted clinical settings in which the prevalence of bizarre diseases is often increased over a hundredfold when compared to non-hospitalized patients, and intensive investigation is the norm. Such zebra hunting, as well as contributing to the escalating costs of medical care, has more subtle effects that are at least as damaging. Dans⁴ lists four consequences that result from focusing on the unusual. First, such a focus produces a 'rule out' mentality when tests are done in situations where the predictive value approaches zero. Secondly, the physician may pay more attention to his own reassurance through the medium of diagnostic testing, than to patients' needs for reassurance through explanation and human contact. Thirdly, concentration on zebras leads them to be seen as interesting, real

BRIEF PRESCRIBING INFORMATION ASPIRIN*

(acetylsalicylic acid tablets, U.S.P.)

THERAPEUTIC OR PHARMACOLOGICAL CLASSIFICATION: Analgesic, anti-inflammatory, anti-pyretic and platelet aggregation inhibitor.

ACTIONS: Acetylsalicylic acid (ASA) interferes with the production of prostaglandins in various organs and tissues through acetylation of the enzyme cyclo-oxygenase. Prostaglandins are themselves powerful irritants and produce headaches and pain on injection in man. Prostaglandins also appear to sensitize pain receptors to other noxious substances such as histamine and bradykinin. By preventing the synthesis and release of prostaglandins in inflammation, Aspirin* may avert the sensitization of pain receptors.

Acetylsalicylic acid's antipyretic activity is due to its ability to interfere with the production of prostaglandin E in the brain. Prostaglandin E, is one of the most powerful pyretic agents known.

Acetylsalicylic acid's inhibition of platelet aggregation is due to its ability to interfere with the production of thromboxane A₂ within the platelet. Thromboxane A₂ is, for a large part, responsible for the platelets' aggregating properties.

INDICATIONS: ASPIRIN (acetylsalicylic acid) is indicated for the relief of pain, fever and inflammation of a variety of conditions such as influenza, common cold, low back and neck pain, dysmenorrhea, headache, toothache, sprains and strains, fractures, myositis, neuralgia, synovitis, arthritis, bursitis, burns, injuries, following surgical and dental procedures.

Aspirin is also indicated for the following uses, based on its platelet aggregation inhibitory properties:

- for reducing the risk of morbidity and death in patients with unstable angina and in those with previous myocardial infarction;
- for reducing the risk of transient ischemic attacks (TIA) and for secondary prevention of atherosclerotic cerebral infarction;
- for prophylaxis of venous thromboembolism after total hip replacement in men;
- for reduction of adhesive properties of platelets in patients following carotid endarterectomy to prevent recurrence of TIA and in hemodialysis patients with a silicone rubber arteriovenous cannula.

CONTRAINDICATIONS: Salicylate sensitivity: active peptic ulcer.

WARNINGS: ASA is one of the most frequent causes of accidental poisonings in toddlers and infants. Tablets should be kept well out of the reach of children.

A possible association between Reye's syndrome and the use of salicylates has been suggested but not established. Reye's syndrome has also occurred in many patients not exposed to salicylates. However, caution is advised when prescribing salicylate-containing medications for children and teenagers with influenza or chickenpox.

PRECAUTIONS: Administer salicylates cautiously to patients with asthma and other allergic conditions, a history of gastrointestinal ulcerations, bleeding tendencies, significant anemia or hypoprothrombinemia.

Patients taking ASA daily are at an increased risk of developing gastrointestinal bleeding following the ingestion of alcohol.

Caution is necessary when salicylates and anticoagulants are prescribed concurrently, as salicylates can depress the concentration of prothrombin in the plasma.

Diabetics receiving concurrent salicylate-hypoglycemic therapy should be monitored closely, and reduction of the sulfonylurea hypoglycemic drug dosage or insulin requirements may be necessary.

High doses (3 g daily) of ASA during pregnancy may lengthen the gestation and parturition time.

Salicylates can produce changes in thyroid function tests.

Sodium excretion produced by spironolactone may be decreased by salicylate administration.

Salicylates in large doses are uricosuric agents, smaller amounts may depress uric acid clearance and thus decrease the uricosuric effects of other drugs.

Salicylates also retard the renal elimination of methotrexate.

ADVERSE EFFECTS:

Gastrointestinal: nausea, vomiting, diarrhea, gastrointestinal bleeding and/or ulceration, dyspepsia, heartburn.

Ear: tinnitus, vertigo, hearing loss.

Hematologic: leukopenia, thrombocytopenia, purpura, anemia.

Dermatologic and hypersensitivity: urticaria, angioedema, pruritus, skin eruptions, asthma, anaphylaxis.

Miscellaneous: mental confusion, drowsiness, sweating, thirst.

SYMPOTMS AND TREATMENT OF OVERDOSAGE:

Symptoms: in mild overdosage these may include rapid and deep breathing, nausea, vomiting, vertigo, tinnitus, flushing, sweating, thirst and tachycardia. In more severe cases, acid-base disturbances including respiratory alkalosis and metabolic acidosis can occur. Severe cases may show fever, hemorrhage, excitement, confusion, convulsions or coma and respiratory failure.

Treatment consists of prevention and management of acid-base and fluid and electrolyte disturbances. Renal clearance is increased by increasing urine flow and by alkaline diuresis but care must be taken in this approach to not further aggravate metabolic acidosis and hypokalemia. Acidemia should be prevented by administration of adequate sodium containing fluids and sodium bicarbonate. Hypoglycemia is an occasional accompaniment of salicylate overdosage and can be managed by glucose solutions. If a hemorrhagic diathesis is evident, give vitamin K. Hemodialysis may be useful in complex acid base disturbances particularly in the presence of abnormal renal function.

DOSAGE:

Analgesic and antipyretic:

Adults: 1-2 tablets (325 mg to 650 mg) orally every 4 hours. Children under 12: 10 to 15 mg/kg every 6 hours, not to exceed a total daily dose of 2.4 g.

Anti-inflammatory:

Adults: 3 tablets (975 mg) 4 to 6 times a day, up to 30 tablets daily, may be required for optimal anti-inflammatory effect. A blood level between 15 and 30 mg per 100 mL is in the desirable therapeutic range.

Children: 60 to 125 mg/kg daily in 4 to 6 divided doses.

Platelet aggregation inhibitor:

- for prophylaxis of venous thromboembolism after total hip replacement in men: 2 tablets (650 mg) twice a day, started 1 day before surgery and continued for 14 days;
- for all other platelet aggregation inhibitory uses: 1 to 4 tablets (325 to 1300 mg) daily, according to individual needs and generally accepted standards for each indication.

AVAILABILITY: Each white tablet with the Bayer Cross* contains 325 mg (5 gr) acetylsalicylic acid. In packages of 12, 24, 48, 100, 200 and 300.

Also supplied as ASA 500 mg tablets U.S.P., in packages of 30, 50 and 100.

Flavoured Children's Size ASPIRIN*: each peach coloured tablet, with pleasant orange taste, contains 80 mg (1 1/4 gr) acetylsalicylic acid. In bottles of 24.

All Sterling ASA preparations are sodium and tartrazine-free.

Product Monograph available to health professionals upon request.

*Registered Trademark of Sterling Drug Ltd.

Aurora, Ontario
L4G 3H6

PAAB
CCPP

References:

1. Lewis, H.D., Jr. et al.: Protective Effects of Aspirin Against Acute Myocardial Infarction and Death In Men With Unstable Angina. N. ENGL J. MED.: 309:396-403, 1983.
2. Cairns, J.A. et al.: Aspirin, Sulfinpyrazone, Or Both In Unstable Angina. Results of a Canadian Multicenter Trial. N. ENGL. J. MED.: 313:1369-1375, 1985.
3. Canner, P.L.: Aspirin in Coronary Heart Disease. Comparison of Six Clinical Trials. Isreal Journal of Medical Sciences, VOL. 19, 1983.
4. Aspirin After Myocardial Infarction. Lancet: 1:1172-1173, May 31, 1980.
5. The Canadian Co Operative Study Group.: A Randomized Trial of Aspirin and Sulfinpyrazone in Treated Stroke. N. ENGL. J. MED.: 299:53-59, (July 13), 1978.
6. Multicenter Study Indicates One Aspirin Can Do The Job of Four in Preventing Stroke. J.A.M.A.: 257:2134-2135 (April 24, 1987).
7. Bousser, M.G., et al.: "AICLA" Controlled Trial of Aspirin and Dipyridamole In The Secondary Prevention of Athero Thrombotic Cerebral Ischemia. Stroke.: 14: 5-14, 1983.
8. Hirsh, J. et al.: Dose Antiplatelet Agents; The Relationship Among Side Effects, And Antithrombotic Effectiveness.: ACCP. NHLBI National Conference On Antithrombotic Therapy. Chest/89/2/February, 1986/ Supplement.
9. Elwood, P.C. et al.: A Randomized Controlled Trial of Acetyl Salicylic Acid In The Secondary Prevention Of Mortality From Myocardial Infarction. British Medical Journal, 1, 436-440, 1974.

problems, and the more common conditions are relegated to the status of trivial and dull. Fourthly, such an approach makes it appear that common problems are not only uninteresting, but are easily handled.

It is inevitable, then, that neophyte family physicians find the issues of test ordering and interpretation very different and difficult when they enter primary care, and these issues represent a dilemma that young practitioners do not resolve until well into the family-practice residency. The prevalence of disease in a particular setting is a phenomenon that has to be 'lived with' for a while until it can properly—albeit subconsciously—be taken into account when diagnostic tests are ordered and interpreted. At least the family physician has the experience of working in both community and hospital settings. One of the costs of early specialization is that fewer and fewer consultants have any experience of primary care, and the recommendations of sub-specialists, in particular, need to be interpreted with caution before they are applied to more general patient populations.

If anything, medical education in the recent past has not only neglected the whole subject of diagnostic testing but, indeed, has contributed to the irrational use of diagnostic tests at all levels of care. Diagnostic testing is yet another area in which family physicians need to assert and research the unique dilemmas presented by primary-care practice.

References

1. Vecchio TJ. Predictive value of a single diagnostic test in unselected populations. *N Engl J Med* 1966; 274:1171-3.
2. Watson RA, Tang DB. The predictive value of prostatic acid phosphotase as a screening test for prostatic cancer. *N Engl J Med* 1980; 303:497-9.
3. Murphy EA. *The Logic of Medicine*. Baltimore: The Johns Hopkins University Press, 1976.
4. Dans PE. The great zebra hunt. *Pharos* 1978; 2-6.

Tony Dixon, MB, ChB, CCMF

Tests diagnostiques : le problème de la prévalence

LE THÈME DE CE MOIS-CI étant la « Médecine de laboratoire », le Dr Rick Birtwhistle lance un appel pour que les demandes d'analyses soient un processus réfléchi plutôt qu'un simple réflexe afin de maximiser l'efficacité réelle et le rendement des soins aux patients.

En 1966, Thomas Vecchio¹ publiait dans le *New England Journal of Medicine* un article intitulé « Predictive value of a single-diagnostic test in unselected populations » qui, en rétrospective, a marqué son époque. Il décrivait comment, lorsqu'un nouveau test était évalué, il était coutumier de l'expérimenter auprès de deux groupes présélectionnés : ceux qui étaient reconnus comme porteurs de la maladie, et des individus choisis dans une population normale, sans évidence de la maladie. Deux valeurs sont ainsi définies : d'abord la sensibilité de l'analyse, c'est-à-dire sa capacité à identifier correctement la présence de maladie et, ensuite, sa spécificité, c'est-à-dire sa capacité à identifier l'absence de maladie.

Vecchio soulignait que le fait de modifier le contexte clinique d'un test peut constituer un défi totalement différent. Selon les conditions de la pratique clinique, ce que le médecin a besoin de savoir, ce n'est pas tellement la performance de ce test auprès de populations connues comme ayant ou non la maladie, mais plutôt sa valeur de prédiction. En d'autres mots, que vaut ce test pour prédire la présence ou l'absence de la maladie chez des populations non sélectionnées.

Comme Birtwhistle le décrit dans son article, le piège réside dans le fait que la capacité d'un test à déceler correctement la présence d'une maladie (une qualité connue sous le terme

« valeur positive de prédiction ») ou son absence (« valeur négative de prédiction ») dépend non seulement de la sensibilité et de la spécificité inhérentes au test mais aussi de la prévalence de la maladie chez la population investigée. Puisque la prévalence de la maladie diminue chez diverses populations, il en va de même pour la valeur positive de prédiction d'un test, ce qui entraîne une augmentation des faux-positifs.

Watson et Tang² ont démontré ce dilemme en étudiant l'usage de la phosphatase acide prostatique comme test de dépistage du cancer de la prostate. Ils en ont présenté les diverses capacités de prédiction en utilisant les prévalences mesurées dans différents contextes cliniques. Lorsqu'appliquée à une population générale chez qui la prévalence estimée du cancer de la prostate pouvait se situer autour de 35/100,000, la valeur positive de prédiction d'un taux élevé de phosphatase acide (sensibilité du test 70%, spécificité 90%) s'est avérée n'être que de 0.4%. Ainsi, lorsqu'on s'en sert comme outil de dépistage, les prédictions de la présence d'un cancer de la prostate, basées sur la présence d'un taux élevé de phosphatase acide, seraient erronées 99.6 fois sur 100. Même chez les hommes à haut risque de plus de 75 ans dont le taux de cancer est estimé à 500/100,000, seulement 5.6% des tests positifs identifieraient correctement la présence de la maladie, et presque 18 patients sur 20 seraient mal diagnostiqués et devraient subir d'autres tests. Par contre, en présence d'une forte suspicion clinique de malignité suite, par exemple, à la palpation d'un nodule prostatique induré, la malignité sera confirmée chez la moitié de ces patients. Dans de telles circonstances,

avec une prévalence de 50,000/100,000, 93% des hommes ayant un test positif seront effectivement bien identifiés et les résultats positifs seront faux dans seulement sept cas sur 100.

Règle générale, la prévalence d'une maladie grave est beaucoup plus faible dans le contexte des soins de première ligne que dans un environnement de soins secondaires ou tertiaires et, en principe, la valeur positive de prédiction des mêmes tests effectués dans une pratique familiale sera inférieure à celle obtenue en milieu hospitalier. Par conséquent, l'usage inconsidéré d'épreuves diagnostiques risque de provoquer un abus de diagnostics et d'entraîner l'investigation et le traitement de patients en bonne santé qu'on aura, à tort, identifiés comme souffrant d'une maladie sur la seule base d'analyse de laboratoire.

Ce problème se trouve compliqué par le fait que, pour plusieurs de ces tests, le point de démarcation entre un résultat « normal » et « anormal » est arbitrairement défini comme étant deux écarts types de la moyenne. Selon la courbe de Gauss distribuant les valeurs chez une population normale non sélectionnée, cela signifie que 2.5% des observations à chacune des extrémités de la courbe étiquetterait comme « anormaux » les gens par ailleurs en bonne santé. Plus le nombre de tests augmente, plus cet effet mathématique s'amplifie. Lorsque cinq tests sont effectués sur une personne en bonne santé, il y a 77% des chances que les résultats soient jugés normaux et, par conséquent, 23% des chances qu'une anomalie fasse l'objet d'un diagnostic erroné. Si on effectue 20 tests, l'individu n'a que 36% de chances d'être considéré « normal », mais il a 64% de

CoActifed*

Tablets/Syrup/Expectorant

Antitussive—Expectorant—Decongestant

Indications: CoActifed Expectorant: To facilitate expectoration and control cough associated with inflamed mucosa and tenacious sputum.

CoActifed Syrup and Tablets: The treatment of cough associated with inflamed mucosa.

Precautions: Before prescribing medication to suppress or modify cough, it is important to ascertain that the underlying cause of the cough is identified, that modification of the cough does not increase the risk of clinical or physiologic complications, and that appropriate therapy for the primary disease is provided.

In young children the respiratory centre is especially susceptible to the depressant action of narcotic cough suppressants. Benefit to risk ratio should be carefully considered especially in children with respiratory embarrassment, e.g., croup. Estimation of dosage relative to the child's age and weight is of great importance.

Since codeine crosses the placental barrier, its use in pregnancy is not recommended.

As codeine may inhibit peristalsis, patients with chronic constipation should be given CoActifed preparations only after weighing the potential therapeutic benefit against the hazards involved.

CoActifed contains codeine: may be habit forming.

Use with caution in patients with hypertension and in patients receiving MAO inhibitors.

Patients should be cautioned not to operate vehicles or hazardous machinery until their response to the drug has been determined. Since the depressant effects of antihistamines are additive to those of other drugs affecting the CNS, patients should be cautioned against drinking alcoholic beverages or taking hypnotics, sedatives, psychotherapeutic agents or other drugs with CNS depressant effects during antihistaminic therapy.

Adverse Effects: In some patients, drowsiness, dizziness, dry mouth, nausea and vomiting or mild stimulation may occur.

Overdose: Symptoms: Narcosis is usually present, sometimes associated with convulsions. Tachycardia, pupillary constriction, nausea, vomiting and respiratory depression can occur.

Treatment: If respiration is severely depressed, administer the narcotic antagonist, naloxone. Adults: 400 µg by i.v., i.m. or s.c. routes and repeated at 2 to 3 minute intervals if necessary. Children: 10 µg/kg by i.v., i.m. or s.c. routes. Dosage may be repeated as for the adult administration. Failure to obtain significant improvement after 2 to 3 doses suggests that causes other than narcotic overdosage may be responsible for the patient's condition.

If naloxone is unsuccessful, institute intubation and respiratory support or conduct gastric lavage in the unconscious patient.

Dosage: Children 2 to under 6 years: 2.5 mL 4 times a day. Children 6 to under 12 years: 5 mL or ½ tablet 4 times a day. Adults and children 12 years and older: 10 mL or 1 tablet 4 times a day.

Supplied: **Expectorant:** Each 5 mL of clear, orange, syrupy liquid with a mixed fruit odor contains: triprolidine HCl 2 mg, pseudoephedrine HCl 30 mg, guaiifenesin 100 mg, codeine phosphate 10 mg. Available in 100 mL and 2 L bottles.

Syrup: Each 5 mL of clear, dark red, syrupy liquid with a pineapple odor and a sweet black currant flavor contains: triprolidine HCl 2 mg, pseudoephedrine HCl 30 mg and codeine phosphate 10 mg. Available in 100 mL and 2 L bottles.

Tablets: Each white to off-white, biconvex tablet, code number WELLCOME P4B on same side as diagonal score mark, contains: triprolidine HCl 4 mg, pseudoephedrine HCl 60 mg and codeine phosphate 20 mg. Each tablet is equivalent to 10 mL of syrup. If tablet is broken in half, it reveals a yellow core. Bottles of 10 and 50 tablets.

Additional prescribing information available on request.

*Trade Mark W-610

PAAB
CCPP

chances d'être considéré « anormal ». Ce phénomène nous amène à la suggestion de Murphy³, à savoir qu'une personne en bonne santé est une personne qui n'a pas été suffisamment investiguée !!

Malheureusement, la majeure partie de la formation médicale se fait encore dans des environnements de soins tertiaires et secondaires des plus éso-tériques, avec le résultat inévitable que les étudiants en médecine sont exposés à des contextes cliniques sérieusement déformés où l'investigation intensive est de rigueur et où la prévalence de maladies bizarres est souvent centuplée par rapport à celle de patients non hospitalisés. Cette recherche obstinée de la rareté, en plus de contribuer à l'escalade du coût des soins médicaux, a des effets plus subtils qui sont au moins tout aussi néfastes. Dans⁴ liste quatre conséquences de cette concentration sur l'inhabituel. D'abord, une telle concentration produit une mentalité d'« élimination » lorsque ces tests sont effectués dans des contextes où la valeur de prédiction se situe à près de zéro. Deuxièmement, le médecin peut s'attarder davantage à se rassurer lui-même par l'entremise d'épreuve diagnostiques qu'à rassurer ses patients par un contact humain et des explications appropriées. Troisièmement, cette concentration sur l'inhabituel amène à considérer ces problèmes comme étant intéressants et réels, et les conditions plus courantes sont reléguées au statut d'insignifiantes et d'ennuyeuses. Quatrièmement, une telle approche suggère non seulement que les problèmes courants manquent d'intérêt mais qu'il est facile de les solutionner.

Il est inévitable alors que les médecins de famille néophytes constatent que les demandes d'analyses et leur interprétation soient très contradictoires et pénibles lorsqu'ils commencent à dispenser des soins de pre-

mière ligne, et ces questions constituent un dilemme que les jeunes praticiens ne résolvent pas avant d'avoir complété une bonne partie de leur résidence en médecine familiale. La prévalence de la maladie dans un contexte particulier est un phénomène avec lequel il faut « vivre » pendant un certain temps jusqu'à ce que — bien inconsciemment — on puisse adéquatement en tenir compte en demandant et en interprétant les épreuves diagnostiques. Au moins le médecin de famille a-t-il l'expérience du travail en milieu communautaire et en milieu hospitalier. L'une des conséquences de la spécialisation précoce réside dans le fait que de moins en moins de consultants ont une expérience des soins de première ligne et que les recommandations des sur-spécialistes, en particulier, ont besoin d'être interprétées avec prudence avant d'être appliquées à des populations générales de patients.

Non seulement la formation médicale aura-t-elle, au cours des dernières années, négligé toute la problématique des tests diagnostiques mais elle aura aussi contribué à l'usage irrationnel des épreuves diagnostiques à tous les niveaux de soins. Ce domaine des tests diagnostiques est un autre secteur où les médecins de famille devront s'affirmer et approfondir les dilemmes uniques générés par la pratique des soins de première ligne.

Références

1. Vecchio TJ. Predictive value of a single diagnostic test in unselected populations. N Engl J Med 1966; 274:1171-3.
2. Watson RA, Tang DB. The predictive value of prostatic acid phosphatase as a screening test for prostatic cancer. N Engl J Med 1980; 303:497-9.
3. Murphy EA. The Logic of Medicine. Baltimore: The Johns Hopkins University Press, 1976.
4. Dans PE. The great zebra hunt. Pharos 1978; 2-6.



WELLCOME MEDICAL DIVISION
BURROUGHS WELLCOME INC.
KIRKLAND, QUÉ.